

CLAIMS

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1. A micromachine comprising:
a second microstructured portion of a predetermined shape, at least a part of which
is formed by mold transfer; and
a first microstructured portion for driving this second microstructured portion.
2. The micromachine according to claim 1, wherein said second microstructured
portion has a switching function.
3. The micromachine according to claim 1, wherein said second microstructured
portion has a function to be performed as an optical switching element.
4. The micromachine according to claim 1, wherein said first microstructured portion
and said second microstructured portion are arranged in an array.
5. The micromachine according to claim 1, which further comprises a third
microstructured portion of a predetermined shape, wherein said third microstructured
portion is not driven by said first microstructured portion, and wherein at least a part of
said third microstructured portion which relates to said second microstructured portion is
formed by mold transfer.
6. The micromachine according to claim 5, wherein a predetermined gap or step is
provided between said second microstructured portion and said third microstructured
portion.

7. The micromachine according to claim 1, wherein said first microstructured portion is formed by photolithography techniques.

5 8. The micromachine according to claim 1, wherein said second microstructured portion is made of a resin.

9. The micromachine according to claim 8, wherein said second microstructured portion is made of a photosetting resin.

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10. The micromachine according to claim 8, wherein a boundary surface between said first microstructured portion and said second microstructured portion is made of a metallic material.

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11. A micromachine manufacturing method for manufacturing a micromachine, in which a first microstructured portion is operative to drive a second microstructured portion of a predetermined shape, comprising:

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a molding step of forming at least a part of said second microstructured portion which is overlaid on said first microstructured portion by mold transfer, after said first microstructured portion is manufactured.

12. The micromachine manufacturing method according to claim 11, wherein said second microstructured portion has a switching function.

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13. The micromachine manufacturing method according to claim 11, wherein said

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second microstructured portion has a function to be performed as an optical switching element.

14. The micromachine manufacturing method according to claim 11, wherein said first microstructured portion and said second microstructured portion are arranged in an array, and wherein a part of each of the plurality of second microstructured portions arranged in the array is transferred by using a same mold used in said molding step.
15. The micromachine manufacturing method according to claim 11, wherein said micromachine has a third microstructured portion, which is not driven by said first microstructured portion, and wherein at least a part of said third microstructured portion which relates to said second microstructured portion is transferred by using a same mold used in said molding step.
16. The micromachine manufacturing method according to claim 15, wherein a predetermined gap or step is formed between said second microstructured portion and said third microstructured portion in said molding step.
17. The micromachine manufacturing method according to claim 11, which further comprises a photolithography step to be performed before said molding step, wherein said first microstructured portion is formed by photolithography techniques in said photolithography step.
18. The micromachine manufacturing method according to claim 17, which further comprises a step of etching a sacrifice layer after said molding step, wherein said sacrifice

layer, which is provided around said first microstructured portion, is not etched at said photolithography step.

19. The micromachine manufacturing method according to claim 17, wherein no
5 metallic film is formed on a boundary surface, on which said second microstructured portion is stacked, in said photolithography step.

20. The micromachine manufacturing method according to claim 11, which further
10 comprises a step of providing a sacrifice layer around said first microstructured portion before said molding step.

21. The micromachine manufacturing method according to claim 11, which further
15 comprises a step of planarizing said first microstructured portion and surroundings thereof before said molding step.

22. The micromachine manufacturing method according to claim 11, wherein a mold
used in said molding step is formed on a silicon substrate by a combination of anisotropic etching and isotropic etching in such a manner so as to have a predetermined shape.

20 23. The micromachine manufacturing method according to claim 11, wherein a mold used at said molding step is adapted to transmit light.

24. The micromachine manufacturing method according to claim 11, wherein a mold
25 used in said molding step is a secondary mold obtained by reverse-forming of said first mold.

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27. The micromachine manufacturing method according to claim 11, wherein said molding step has a step of forming said second microstructured portion by removing a part thereof after molded by mold transfer.